

CHAPTER

14

Laboratory Management

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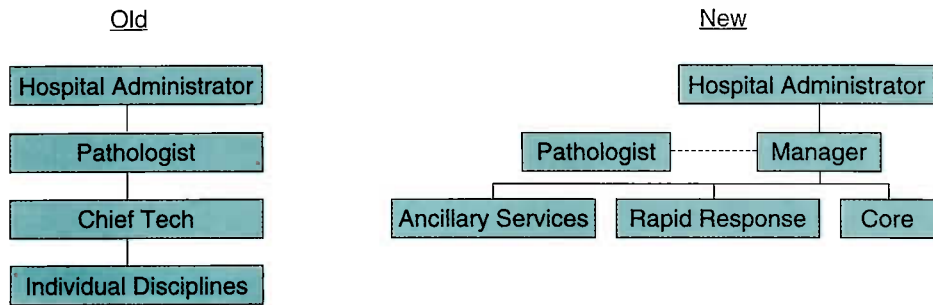
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I. NATURE OF MANAGEMENT

A. Information Age: Management has changed from supervision of “factory” workers to coordination of knowledge workers.

B. Organizational Structure



II. MANAGEMENT PROCESSES

A. Managerial Roles and Functions

1. Managerial functions include planning, organizing, directing, decision making/problem solving, coordinating, and communicating.
2. Managerial roles include:
 - a. Represent the organization
 - b. Hold formal authority
 - c. Develop and implement strategies to accomplish mission and goals of the organization
 - d. Manage personnel
 - 1) Evaluations
 - 2) Hiring
 - 3) Promoting
 - e. Manage financial responsibilities
 - 1) Budget
 - a) Capital
 - b) Operating
 - 2) Revenue
 - 3) Expenses
 - f. Facilitate communication: Employees, supervisors/team leaders, colleagues, and patients
 - g. Motivate: Employees, supervisors/team leaders, colleagues, and self
 - h. Implement time management strategies
 - i. Oversee customer service
 - j. Implement innovative ways to expand services, expand customer base, and fulfill the bottom line

B. Planning

1. **Definition:** Develop a pathway(s) to accomplish the organization's mission and goals using resources and time
2. **In order to plan for the future, one must first determine where the organization stands.** A **SWOT** analysis should be performed to determine both internal and external factors.
 - a. Internal factors
 - 1) **S:** Strengths of the organization
 - 2) **W:** Weaknesses of the organization
 - b. External factors
 - 1) **O:** Opportunities available to the organization
 - 2) **T:** Threats to the organization
3. Once the SWOT analysis is complete, the manager can plan a course of action for the organization to follow that will accomplish its goals and mission.
4. Formulating **goals**
 - a. Written goals allow all employees to work toward a common result.
 - b. Goals should be broad; objectives are written to achieve specific tasks.
5. Writing **objectives**
 - a. Objectives are tasks to achieve goals.
 - b. Objectives are focused on achieving one goal.
 - c. Each objective deals with one task.
 - d. Objectives are very specific.
 - e. Objectives are written using action verbs.
 - f. Objectives are evaluated against specific and specified numerical criteria.
6. **Types of plans**
 - a. **Short range or tactical plans** cover a 1- to 5-year period and focus on tasks that can be completed in this time frame.
 - b. **Operational planning** may be for 1 year or one budget period and concerns operations.
 - c. **Strategic planning** maps out the course of an organization for approximately 20 years. Strategic plans involve tactical and operational plans as well as forming alliances and partnerships with key players (sometimes even competitors). This plan is evaluated and modified yearly.

C. Organizing

1. **Time management**
 - a. Laboratorians have their work dictated by the healthcare system—patient admissions, emergency patients, and outpatients. Managers have more flexibility to plan their work because it is dictated by administration (organization).
 - b. Managers have more control over their workload and, therefore, they must identify, control, and eliminate or curtail specific situations that rob them of time.

- 1) These tasks may require most of a manager's resources. Identify important tasks and make sure these are accomplished first.
- 2) Develop skills necessary to facilitate use of manager's time.
 - a) **Managerial skills:** Organized, able to delegate, knows when to say "no," can take control, effective planning, able to prioritize, conducts effective meetings, good listening skills, gives clear and concise instructions, understands teams
 - b) **Educated:** Self-study through seminars, management journals, experience, or formal management course work
 - c) **Awareness of the work culture:** Knows the organization and/or goals, able to see the "big" picture
 - d) **Controls interferences:** Avoids lengthy unnecessary phone calls, "drop-in" visitors, reading junk mail, and too much socializing
 - e) **Decision-making capabilities:** Controls perfectionism, able to make a decision, appropriately detail oriented
 - f) **Develops resources:** Adequate money in budget, functional and up-to-date equipment, adequate staff, and support from the administration
 - g) **Self-discipline:** Avoids procrastination, inappropriate socializing, meets deadlines, behavior sets example for employees
2. **Structure**
 - a. The manager develops a structure that allows plans to be carried out and objectives accomplished.
 - b. The organizational structure is based on authority, responsibility, and accountability.
 - 1) **Authority**
 - a) Formal: Assigned by organization or administration
 - b) Informal: Gained informally through competence or leadership qualities
 - 2) **Responsibility:** Assigned by administration through delegation
 - 3) **Accountability** occurs when the person responsible for completing a task is evaluated to determine if the task was completed.
3. **Reengineering**
 - a. **Definition:** Reorganizing work processes in an organization
 - b. Flow diagram the specific work processes to determine if more effective processes could be implemented.
 - c. Examples of reengineering
 - 1) Use of robotics to automate (particularly specimen processing)
 - 2) Computerization
 - 3) Pneumatic tube system to transport specimens
 - d. **Benchmarking** is a process whereby the best process in one organization is modified to fit similar processes in another organization.
 - e. Examples of benchmarking
 - 1) Cost per test

2) Number of tests performed per FTE (full-time equivalent/employees paid for 2080 hours per year)

3) Number of corrected reports

4. **Inventory management**

- a. Objective of an efficient laboratory is to experience few shortages in testing reagents, supplies, and materials.
- b. Requisitions for contract and purchase orders to obtain necessary quantities of materials, etc., in suitable time frames
- c. Managers are responsible for purchasing laboratory instruments and service contracts to maintain instruments.
- d. Instrument selection includes technical evaluation and cost comparison of instruments from various instrument manufacturers.
- e. Many hospital laboratories contract with outside agencies to provide blood products for patients.
- f. Hospitals contract with outside companies to manage biohazardous waste and/or hazardous waste disposal.

D. **Directing**

1. **Definition:** Persuading employees to perform the tasks that help the organization accomplish its mission and goals
2. Techniques of directing
 - a. **Authoritative** encompasses issuing orders and telling someone what to do. It does not allow employee to decide how best to accomplish task.
 - b. **Coaching** allows the instilling of confidence and motivation into an employee about accomplishing a task. The employee has more “say-so” in how to accomplish a task.
 - c. **Empowerment** allows an employee to determine what task and how to accomplish the task to help the manager solve a problem or to allow an organization to come closer to accomplishing their mission and goals. Employees are allowed to be creative and innovative to solve problems. Employees are allowed to take risks without fear of admonishment for failing.
3. **Communicating**
 - a. Face-to-face **spoken communication**
 - 1) **Advantages**
 - a) Immediate message conveyed
 - b) Feedback immediate
 - c) Can determine other factors: body language, tone of voice, eye contact, and implied meanings
 - 2) **Disadvantages**
 - a) Cannot save the communication
 - b) Receiver interpretation of message may be different from that of speaker’s intentions.

- c) Body language, tone of voice, eye contact may confuse recipient or sender.
 - d) Cannot retract spoken words
 - e) Gender, age groups, ethnicity, professional, emotional state, and other barriers exist for effective communication.
- b. **Written communication**
 - 1) **Advantages**
 - a) Can save communication encounter
 - b) Deliver same message to many receivers
 - c) Can add graphics to explain or clarify message
 - d) Readers can review, interpret, and then respond to initial message.
 - 2) **Disadvantages**
 - a) Feedback delayed
 - b) Can be impersonal
 - c) Final
 - d) Memos and e-mail are considered informal communication; letters are considered formal communication.
- c. **Listening**
 - 1) Active listening components
 - a) Privacy
 - b) Eliminate (reduce) physical barriers
 - c) Listen to words, but look at behavior, and interpret implied meaning
 - 2) Restate what you think you have heard to ensure accuracy and capture any implied meanings.
 - 3) Remain objective, but give signals (nod, keep eye contact, say “go on”) to show speaker that you are listening.
 - 4) Identify what the sender wants from the listener.
 - 5) Summarize the plan for action and the time when action will be complete.
- 4. **Motivating**
 - a. **Definition:** Influencing a person to act in a particular way and to generate initiative within that person
 - b. **Motivators include:**
 - 1) Reward (i.e., bonus)
 - 2) Empowerment
 - 3) Praise
 - 4) Recognition
 - 5) Salary
 - 6) Encouragement
- 5. **Delegating**
 - a. **Definition:** Assigning responsibility, authority, and accountability for a task to an employee
 - b. **Effective delegation** occurs when the manager selects the right task for the right person, prepares an overview of exactly what must be done,

allows time for the task to be completed, and then provides recognition for performing the task.

6. Coaching

- a. Create an atmosphere of trust.
- b. Allow employees to take risks and not be reprimanded for failures.
- c. Make everyone feel that he or she is important.
- d. Work through emotions of players.
- e. Seek feedback by asking questions.

E. Giving Directives and Managing Change

1. Managerial function that enables the manager to get his or her people to do the most and their best
2. Work done through employees with development of their skills by managers
3. Good directives
 - a. **Reasonable:** An employee is able to, desires to, and has resources to do so
 - b. **Understandable:** The employee has clear expectations and can repeat the directive in his/her own words accurately.
 - c. **Appropriately worded** and delivered in a nonthreatening tone; presented in the form of a suggestion; avoid giving orders
 - d. **Important** for getting the job done; requests should not be made for personal gain of supervisor
 - e. **Time limits** should be included in directives and should be of reasonable length.
4. Major techniques for directives
 - a. **Autocratic**
 - 1) Detailed instructions given of exactly how and what is to be done.
 - 2) The manager's way is the best, and employees need not think of another way to complete the task.
 - 3) This inhibits employees from thinking for themselves. They lose interest and initiative. Ambition, imagination, and involvement in daily job will be diminished or lost.
 - b. **Consultative**
 - 1) Also called participative, democratic, permissive, or empowered management
 - 2) Views employees as eager to do a good job and equipped with the skills to do so
 - 3) Believes employees will become more motivated if left alone to do their job
 - 4) Input is sought from employees to help solve a problem or tackle a project.
 - 5) Employees are consulted about tackling a project. When in agreement, an employee is assigned to the project and needs to complete it within a specific time frame. The employee decides how the project is to be accomplished.

- 6) Information must flow freely between manager and employee. Good ideas need to be explored, no matter who thinks of them.
 - 7) Employees are allowed to think for themselves and make worthwhile contributions to the organization.
 - 8) Atmosphere is created of mutual confidence in which the employee can call on the manager when necessary with no fear of reprisal.
 - 9) It is similar to active learning which is more effective than passive learning. Employees work out solutions to problems and projects more effectively than giving them the solutions.
- c. **Change and influence**
- 1) Organizations are constantly changing in leadership positions to capture more market share and to meet technological advancements.
 - 2) The degree and complexity of changes vary among departments in organizations.
 - 3) Change is best accepted by employees if presented in a nonthreatening way. Managers must promote change and keep morale high.
 - 4) Explaining the reasons for change may lead to acceptance by many employees.
 - 5) Reasons people resist change
 - a) **Uncertainty:** They do not want to be moved out of their comfort zone, because it will take effort on their part to analyze the change, learn new procedures, or perform additional tasks.
 - b) **Perception:** Everyone has particular life experiences, values, and perceptions. Each individual has a different perception of the same event.
 - c) **Loss:** Within the organization, there exist relationships among all workers that are built upon respect, trust, and expertise. Change can destroy all those relationships and make people lose status or perceived status among peers.
 - d) **Self-interests:** Change disturbs the current state of affairs. Even though it may not be perfect, people have arranged their lives so their need satisfaction is stable. Change produces instability and uncertainty.
 - e) **Insecurity:** Job security and being able to earn a wage that will allow an individual to pay the bills and maintain a decent standard of life is why people work. Change usually produces insecurity because people see their jobs threatened or taken away from them.
 - 6) Overcoming resistance to change
 - a) Managers should allow ample time for the change and not expect to follow a rigid timeline for implementing the change.
 - b) Employees deserve to know why changes are being made. Managers should give employees plenty of time to have their questions and

concerns answered. The manager should also state the desired effects of the change.

- c) Managers should involve employees in planning and implementing the change. When employees take part in making something happen, they are more likely to take ownership and accept the change more readily.
- d) **Change is stressful for everyone.** It is important to include stress management techniques to help decrease the stress of change.

F. Leadership

1. Essential component of every organization; different from management
2. **Purpose:** Leadership produces change.
 - a. **Management** involves planning and budgeting, organizing and staffing, controlling, and problem solving.
 - b. **Leadership** involves **establishing direction, aligning, motivating, and inspiring people.**
3. Structure of leadership
 - a. **Purpose:** To create leadership processes and help produce changes needed to cope with a changing environment
 - b. **Content:** Can vary from very focused to very broad
 - c. **Assignment:** Roles are assumed or assigned in a more fluid way in businesses that change often.
4. The origin of leadership
 - a. Personal characteristics: High drive/energy level, good intelligence and thinking skills, good mental and emotional health, and integrity
 - b. Career experiences
 - 1) **Promote leadership:** Challenging assignments early in a career, visible leadership role models who are very good or very bad, assignments that broaden a person's experience
 - 2) **Inhibit leadership:** A long series of narrow and tactical jobs, vertical career movement, rapid promotions, measurements and rewards based on short-term results only
5. The following steps can assist a leader in producing meaningful change in an organization.
 - a. **Establish direction:** A vision of the future of the organization is established and strategies are developed and implemented to bring the organization closer to that vision.
 - b. **Align people:** Communicate the vision and strategies to other people using words and deeds so that the vision and strategies are understood and accepted.
 - c. **Motivate and inspire:** Energize people to implement the vision and strategy changes by satisfying basic needs (achievement, belonging, recognition, self-esteem, and a control of one's life) that may go unmet.

III. REGULATORY ELEMENTS

A. Definitions

1. **Accreditation:** The approval of an institution, part of an institution, or program, demonstrating that it meets all formal standards as defined by the accrediting body
2. **Certification:** Official acknowledgement of the passing of a qualifying examination
3. **Licensure:** The process by which a competent public authority grants permission to an organization or an individual to engage in a specific professional practice, occupation, or activity

B. Agencies

1. **American Association of Blood Banks (AABB)** is an international association established to promote the highest standards of care in all aspects of blood banking. Blood Bank laboratories that are part of hospitals can be accredited and inspected jointly by AABB and CAP.
2. **American Society for Clinical Pathology (ASCP)** is a professional organization for individuals working in clinical laboratory medicine. The ASCP Board of Registry offers certification examinations for clinical laboratory personnel.
3. **Clinical Laboratory Improvement Amendments of 1988 (CLIA '88)** refers to legislation that mandates the conditions that must be met for laboratories to be certified. All laboratories performing laboratory testing, regardless of where the labs are based, must maintain an active CLIA license and be subject to inspections by their State branch of the federal CLIA agency. The requirements cover quality assurance, quality control, proficiency testing, record retention, complexity of tests (high, moderate, and waived), job categories, and personnel requirements to perform testing, supervise, and direct laboratories.
4. **College of American Pathologists (CAP)** accredits laboratories. The survey is on a 2-year cycle with interim participation in proficiency testing required to assure ongoing quality of all laboratory test procedures.
5. **Food and Drug Administration (FDA)** reviews and approves new analytical methods prior to marketing by the manufacturer to laboratories. The FDA also inspects all Blood Banks to assure the ongoing safety of the nation's blood source.
6. **The Joint Commission** evaluates and accredits most of the healthcare organizations in the U.S. If the laboratory is accredited by CAP, the on-site inspection of the facility by the Joint Commission will include only the transfusion service, safety, and employee competency and education.
7. **National Credentialing Agency for Laboratory Personnel (NCA)** offers certification examinations for clinical laboratory scientists.

IV. MANAGING FINANCES

A. Principles

1. Budget statement

a. Income statement or **revenue/expense spreadsheet**

- 1) Shows revenue generated and expenses incurred over a period of time (month, quarter, year)
- 2) Net income = revenue generated – expenses incurred

b. **Balance sheet**

- 1) Shows the financial situation of the organization at a specific point in time
- 2) This sheet contains current assets (cash, patient receivables, inventory), current liabilities (accounts payable, accrued salaries), property and equipment (land, building, equipment, and instruments), and long-term obligations (bonds payable, loans).
- 3) Equation is: **assets = liabilities + net worth**

c. **Cash-flow statements**

- 1) Show the inflow and outflow of cash for a specific period
- 2) These statements show the net cash flow from operations, net flow from investments, and net cash flow from financial activities.

d. Miscellaneous data needed by managers: Test volumes per laboratory section, supply costs, labor costs, cost per billable test, workload, rejection rates, contamination rates, and productivity

2. Budgets

- a. Usually done annually as a plan for spending for the next year
- b. Incorporates workload data, new programs, test costs, previous year revenues, previous year costs, capital equipment costs, operating expenses, labor costs, and equipment maintenance costs
- c. Most organizations use data from the previous year, then estimate increased costs for the coming year and add this figure to the budget.
- d. Zero-based budgeting involves starting the budget process from a zero figure and justifying and researching every cost that will be incurred before arriving at the final budget.

3. Revenue

a. **Medicare and Medicaid**

- 1) The federal government pays healthcare organizations for providing care to beneficiaries using a method called **Prospective Payment System (PPS)**.
- 2) Healthcare organizations are paid a lump sum for services according to the **Ambulatory Payment Classification (APC)** for **outpatient** services and the **Diagnosis-Related Group (DRG)** for **inpatient** services. **Current Procedural Terminology (CPT)** is a Medicare coding system for reimbursement at the procedural level.

- 3) The government established a database and derived average costs for many illnesses based on the **International Classification of Disease (ICD-9)**. The APC and DRG are based on ICD-9 codes.
- 4) The government develops a payment schedule, and this is the amount an organization is paid.
- b. **Health maintenance organizations (HMOs)**
 - 1) HMOs contract with hospitals to provide services for patients.
 - 2) For **outpatient** services, the healthcare provider is paid a **set fee** to provide specific services per HMO enrollee. For example, if an HMO has 300 enrollees (covered lives), it may contract with the hospital to provide X-ray, laboratory, and physical therapy services for its patients at \$100/patient per year.
 - 3) This method is call **capitated reimbursement**; it is based on the number of enrollees at a specific payment amount per enrollee.
 - 4) For **inpatient** services, a specific amount is paid per day (per diem) based on the **admitting ICD-9 code**.
4. Operating Costs
 - a. **Operating costs** are what it costs to produce test results. This includes direct and indirect costs.
 - b. **Direct costs** are directly associated with producing test results. These include supplies and labor.
 - c. **Indirect costs** indirectly contribute to producing laboratory tests. These include electricity, water, paper towels, soap, bleach, computer software, and the labor that supports these services, as well as supervisory, managerial and administrative labor.
 - d. **Fixed costs** remain the same from month to month no matter how many tests are produced.
 - e. **Variable costs** change with the amount of work performed.
 - f. **Capital costs** are related to purchasing equipment or instruments that have a life span of more than 1 year and cost more than a set dollar amount. This figure is determined by the organization and usually ranges from \$1000 to \$5000.

B. Cost Management

1. **Definition:** Keeping cost as low as possible without compromising the quality of care delivered to patients
2. Employees become very valuable sources for suggestions to increase efficiency and effectiveness of work patterns.

C. Cost Analysis

1. **Cost per billable test** entails gathering data on wages, collection and handling fees, reagent cost, control and reference materials cost, disposables cost, instrument maintenance, depreciation, miscellaneous costs, and indirect costs.

2. Cost per Billable Test Calculation

Cost for testing = instrument cost + administration costs + supplies + labor

Revenue per test = total revenue ÷ total number of tests

Profit = revenue per test – cost per test

D. Breakeven Analysis

1. **Breakeven analysis** = where revenues equal expenses
2. Calculation

Breakeven (BE) test volume = annual fixed costs ÷ (test price – variable costs per test)

BE minimum price per test = [annual fixed costs + (test volume × variable costs per test)] ÷ test volume

BE minimum revenue = annual fixed costs ÷ [(test price – variable costs per test) ÷ test price]

E. Cost Accounting

1. **Definition:** Systems that study costs associated with performing tests
2. Focuses on internal processes

F. Cost Containment

1. Focuses on ways of first reducing costs, then maintaining quality
2. Centralizing services is one way to control costs.
 - a. Centralized purchasing
 - b. Centralization of jobs
3. Decreases unnecessary testing
4. Encourages employee retention, retraining, cross training, and flexible wage and benefits programs

V. QUALITY MANAGEMENT

A. Championed by Deming, Juran, Crosby, and Shewhart

B. Quality Programs

1. Components
 - a. **Statistical analysis** is especially important in production control. It is used to analyze the quality of results. In the laboratory, statistical analysis includes internal and external quality control.
 - b. **Training and education:** Employees are not considered the problem. Employees need adequate training and education to perform the best possible job. Inadequate training and education leave an employee unprepared to perform their best.

- c. **Evaluation:** Quality programs establish goals or targets. The progress toward accomplishing these goals is assessed. If satisfactory progress toward a goal is not achieved, then the process needs to be changed or modified to achieve satisfactory progress toward a goal.
- d. **Feedback:** This is a continuous process. Monitoring and evaluation takes place for several indicators.

C. Continuous Quality Improvement (CQI)

1. Synonyms and processes:
 - a. **Total quality improvement (TQI), total quality management (TQM), performance improvement (PI)**
 - b. **Quality circle** is defined as 8–12 employees from various departments who work together using CQI principles to improve a process.
 - c. Top management must be committed to CQI for it to work.
 - d. The data teams generate is vital and important to the process, but the success of CQI is dependent upon using this data to improve existing processes.
 - e. **Lean thinking** focuses on removing waste and increasing the value of the service. Only do things that add value and eliminate all other activity. Lean processing does not require a lot of mathematical analysis.
 - f. **Six Sigma** focuses on reducing the variation in a process to remove error. Six Sigma uses a disciplined methodology that is data driven.
2. The cycle of quality improvement that was developed by Deming:
 - a. **P.D.C.A.: Plan → Do → Check → Act**
 - b. **Feedback is a crucial step in this cycle.** Without feedback, there is no improvement.
3. Quality management may use Pareto charts, flowcharts, or cause-and-effect charts to describe processes.



review questions

INSTRUCTIONS Each of the questions or incomplete statements that follows is comprised of four suggested responses. Select the *best* answer or completion statement in each case.

1. What section of the clinical laboratory is regulated by the Food and Drug Administration?
A. Chemistry
B. Blood Bank
C. Serology
D. Hematology
2. The abbreviation MBO stands for which of the following?
A. Means by objectives
B. Management by objectives
C. Management by order
D. Measurement by objectives
3. A number of management styles are used by supervisors in laboratories. Which of the following is *not* a management style?
A. Autocratic
B. Consultative
C. Formal
D. Democratic
4. What is the meaning of the abbreviation FTE?
A. Full-time equivalent
B. Full-time expenditure
C. Fixed total expenditure
D. Fixed-timely equivalency
5. Most laboratories have a definite structure that establishes the formal setup of the various departments and levels. Which of the following refers to this structure?
A. Administration table
B. Laboratory directory
C. Report of contact
D. Organizational chart
6. In a budget, what terminology is used to describe money spent for a nonexpendable item that has a life expectancy greater than one fiscal year?
A. Expenditure
B. Annual cost
C. Capital expenditure
D. Depreciable item

7. Which governmental legislation has had the greatest impact on the health care industry?
 - A. Clinical Laboratory Improvement Act
 - B. Medicare and Medicaid
 - C. Fair Labor Standards Act
 - D. Occupational Safety
8. Which of the following is the process by which a competent public authority grants permission to an organization or an individual to engage in a specific professional practice, occupation, or activity?
 - A. Accreditation
 - B. Certification
 - C. Licensure
 - D. Credentialing
9. Scheduling is a responsibility of most laboratory supervisors. Which factor is *not* a consideration in scheduling?
 - A. Employee preference
 - B. Laboratory hours
 - C. Workload trends
 - D. Leave patterns
10. A proper understanding of why a laboratory may become liable for the actions of its personnel requires a basic knowledge of the laws involved. This area is known as tort law and involves three types of wrongful conduct. Which of the following is *not* considered wrongful conduct?
 - A. Causation
 - B. Intentional acts
 - C. Strict liability
 - D. Negligence
11. DRG is a commonly used abbreviation. Which of the following statements is *not* associated with DRGs?
 - A. Related to Medicare patients
 - B. Deals with hospital reimbursement
 - C. Used in budgeting and planning
 - D. Same system used in every state
12. Which of the following is associated with the outpatient PPS system of reimbursement?
 - A. DRG
 - B. Capitated rate
 - C. APC
 - D. PPO
13. Which of the following factors is *not* needed for an effective employee performance appraisal?
 - A. Job description
 - B. Organization standards
 - C. Written evaluation
 - D. Employer-employee discussion
14. Which of the following is *not* associated with benchmarking?
 - A. Measurement of labor-hours with worked and paid productivity
 - B. Quality control devices
 - C. Capital expenditures
 - D. Number of corrected reports
15. Which of the following is *not* a part of the budget-making process as related to laboratories?
 - A. Cost analysis
 - B. Coordinating
 - C. Determination of fixed and variable costs
 - D. Breakeven analysis

16. Which area of questioning in the interview process is inappropriate or illegal?
 - A. References
 - B. Age
 - C. Education
 - D. Experience
17. Which of the following should *not* be included in a job description?
 - A. Job duties
 - B. Position title
 - C. Qualifications
 - D. Job securities
18. Disciplinary action is a responsibility of supervision. Which of the following characteristics should be included for discipline to be effective and positive?
 - A. Public
 - B. Casual
 - C. Timely
 - D. Written
19. What voluntary agency is developing and implementing Blood Bank practices for the clinical laboratory?
 - A. OSHA
 - B. FDA
 - C. AABB
 - D. PPS
20. Which of the following is *not* associated with the goals of a laboratory continuing education program?
 - A. Staff development
 - B. Improvement of laboratory functioning
 - C. Compliance with accreditation requirements
 - D. Prevention of boredom
21. Which of the following is *not* considered a line item of the laboratory budget?
 - A. Labor union dues
 - B. Supplies
 - C. Maintenance and repair of instruments
 - D. Fixed expenses
22. Which of the following agencies is generally responsible for the inspection and accreditation of clinical laboratories in the United States?
 - A. CAP
 - B. NCA
 - C. CDC
 - D. ASCP
23. What is the strategic process of attracting and maintaining a customer base called?
 - A. Marketing
 - B. Discretionary factors
 - C. Market environment
 - D. Product differentiation factors
24. For marketing purposes, which term best describes the laboratory customer?
 - A. Captive market
 - B. Patient-physician as partners
 - C. Discretionary buyer
 - D. Person or organization paying the bill
25. Assume that the chemistry analyzer in the laboratory of a 500-bed hospital yields 60,000 profiles per year made up of ten results each. The number of quality control (QC) tests performed per year numbers 2400, and the total direct labor cost is \$1.50 per test. The cost for a year's supply of QC reagents is \$3000. What are the QC direct labor cost per profile and the QC consumable cost per profile, respectively?
 - A. \$0.05, \$0.06
 - B. \$0.06, \$0.05
 - C. \$0.08, \$0.05
 - D. \$0.60, \$1.25

26. Your lab has added a new test. It is important that you determine what the breakeven point is in the number of tests. The revenue per unit has been \$10.00, whereas your fixed cost is \$400.00 and your variable cost is \$2.00. What is the breakeven point, if you expect your net income to be zero (no profit and no loss)?
- 45
 - 48
 - 50
 - 52
27. A laboratory has 14,159 total hours paid. Of the total hours paid, 1263 hours are nonproductive hours. Assuming that a full-time employee works 2080 hours annually, what is the total number of FTEs needed to run the laboratory and the number of productive FTEs, respectively?
- 6.2, 5.8
 - 6.8, 6.2
 - 7.4, 6.8
 - 11.2, 10.2
28. As a result of fraud and abuse identified by the Office of the Inspector General (OIG), what are laboratories required to develop?
- Chemical hygiene plan
 - Compliance plan
 - PPE plan
 - Life safety plan
29. Which of the following refers to the portion (percentage) of the cost of an item or service that the Medicare beneficiary must pay?
- Deductible
 - Balance bill
 - Coinsurance
 - Reasonable charges
30. Which of the following established the Equal Employment Opportunity Commission (EEOC)?
- Title VII of the Civil Rights Act of 1964
 - Age Discrimination Employment Act of 1967
 - Rehabilitation Act of 1973
 - The Equal Pay Act of 1963
31. Which of the following refers to a program where the overall activities conducted by the institution are directed toward assuring the quality of the products and services provided?
- Quality control
 - Quality assurance
 - Total quality management
 - Continuous quality improvement
32. Who introduced the use of statistical tools in decision making, in problem solving, and for troubleshooting the production process?
- Philip Crosby
 - Joseph Juran
 - James Westgard
 - Edward Deming
33. Your laboratory is considering expansion. You will have to buy land and build a new lab. One of the financial aspects to consider is the annual depreciation of the project. The total cost of the project is \$800,000 (\$200,000 for the land and \$600,000 for the building). At current estimates, the building is expected to be used for 20 years, with a salvage value of \$40,000. What is the annual depreciation of the project?
- \$38,000/year
 - \$30,000/year
 - \$28,000/year
 - \$10,000/year

34. What process is designed to measure the value (level of success) of performing diagnostic tests and other services related to the improvement of a patient's disease or condition?
 - A. Clinical pathways
 - B. Outcomes assessment
 - C. Clinical practice guidelines
 - D. Quality assurance
35. Which category of personnel is required in laboratories performing tests using high-complexity methodology?
 - A. General supervisor
 - B. Clinical consultant
 - C. Technical consultant
 - D. Director
36. Which of the following is *not* contained in the standard operating procedure manual (SOPM)?
 - A. Literature references
 - B. Control procedures
 - C. Reference ranges
 - D. Personnel requirements
37. When a manager does not possess the expertise or knowledge to implement change and the resisters have significant power to impede the efforts, which strategy for change will be used?
 - A. Facilitation and support
 - B. Participation and involvement
 - C. Negotiation and agreement
 - D. Manipulation and co-optation
38. The struggle is underway, and the behavior of the participants makes the existence of the conflict apparent to others who are not directly involved. What is this stage of conflict known as?
 - A. Perceived
 - B. Felt
 - C. Manifest
 - D. Latent
39. Influence exerted through the control of support services, such as a safety officer or quality assurance coordinator, which provide recommendations to the manager and set policies, is a type of authority known as
 - A. Staff
 - B. Line
 - C. Formal
 - D. Functional
40. What is horizontal communication?
 - A. The official communication message generated by the business activities of the organization
 - B. The formal messages that are channeled through the hierarchical network of the organization
 - C. The activity that occurs during the normal conduct of business among departments, managers, and staff
 - D. Live discourse in which all parties exchange ideas and information and receive spontaneous feedback
41. Which agency develops and monitors engineering and work practice controls?
 - A. The Centers for Disease Control and Prevention
 - B. Occupational Safety and Health Administration
 - C. The Joint Commission
 - D. College of American Pathologists
42. Which of the following refers to the continuum of care under one common computerized communication channel that links hospitals, labs, pharmacies, physicians, employers, payers, and medical information systems?
 - A. Common Healthcare Integrated Network
 - B. Continuum Health Internal Network
 - C. Community Health Information Network
 - D. Computerized Health Information Network

43. Which budgeting process attempts to set expenditures on a variable workload volume?
- A. Operational
 - B. Capital
 - C. Zero-based
 - D. Flexible
44. In addition to preparing a capital budget for the institution's own use, federal and state regulations require healthcare facilities to submit capital plans on certain projects for approval and to obtain a
- A. Certificate of Approval
 - B. Certificate of Need
 - C. Capital Budget Appropriation
 - D. Capital Need Assessment
45. What will be the payback period for a new chemistry analyzer that costs \$150,000 and produces an annual income of \$420,000?
- A. 2.3 months
 - B. 2.8 months
 - C. 4.3 months
 - D. 33.6 months
46. Which of the following is *not* a part of the calculation of the total cost per test?
- A. Direct and indirect labor
 - B. Direct and indirect materials
 - C. Equipment and overhead costs
 - D. Depreciation
47. Which of the following is *not* a role of a team leader?
- A. Leading all team activities
 - B. Teaching problem-solving techniques to team members
 - C. Keeping records of team activities and progress
 - D. Providing guidance for group activities
48. What is the primary coding system that is used by the federal government to determine levels of reimbursement at the procedural level for Medicare services?
- A. CAP codes
 - B. CPT codes
 - C. Modifiers
 - D. ICD-9 codes
49. Your laboratory wants to buy a new hematology analyzer. In determining the total cost per test analysis, you need to know what the cost will be for equipment per test. The analyzer costs \$55,000 and has a useful life of 7 years. After the 1-year warranty expires the annual maintenance contract will cost \$8000. You estimate that you will perform 3500 tests per year on this analyzer. What is the equipment cost for each test performed?
- A. \$1.38
 - B. \$2.10
 - C. \$2.81
 - D. \$4.53
50. Which style of directing allows an employee to determine the task and how to accomplish the task in order to help the manager solve a problem?
- A. Coaching
 - B. Autocratic
 - C. Empowerment
 - D. Authoritative



answers & rationales

1.

B. Immunohematology (blood bank) is the only laboratory section that is regulated by the Food and Drug Administration (FDA). The FDA enforces the Food, Drug, and Cosmetic Act. This Act regulates the preparation of blood and blood products as well as the facilities, including hospital laboratories and transfusion services, where preparation occurs.

2.

B. Management by objectives (MBO) is a management system developed in the 1950s and widely used by many organizations, laboratories, and businesses. MBO uses various management concepts of planning, participation, motivation, and controlling. This system uses performance objectives as a means of accomplishing management goals.

3.

C. The word “formal” is not descriptive of the type of leadership style used by laboratory managers. “Autocratic,” “consultative,” “persuasive,” and “democratic” are words that describe the styles routinely used, although rarely as purely one style; instead, a combination of various styles is used generally. Managers who are autocratic

hold Theory X philosophies and allow for little input from their staff. Managers who are democratic are Theory Y managers and are participatory in their leadership style, actively seek advice and counsel from their coworkers, and allow employees to share in the decision-making process. Various factors, such as the situation, the individuals concerned, and the complexity of concepts involved, will determine what is appropriate.

4.

A. “Full-time equivalent” (FTE) is a term routinely used by every laboratory, particularly during the budget process. An FTE equals 2080 person-hours paid in 1 year’s time. An FTE combines productive hours and nonproductive hours (i.e., vacation, holiday, and sick time). The FTE is based on a 40-hour workweek and is more easily used in a discussion of personnel and hours worked. In one FTE, one full-time person or two or more part-time persons may occupy the 40-hour position.

5.

D. The organizational chart shows the lines of supervision, relationships of various staff members, and interrelationships of the various departments. There are generally three types of organizational charts: vertical, horizontal, and circular. Most hospital administrations use the vertical chart, which is a summary or a snapshot of the structure of the organization. It is also used by many levels of laboratory management.

6.

C. The term “capital expenditure” refers to the money spent for nonexpendable items having a life expectancy of more than one fiscal year. Capital expenditures are generally for permanent items of equipment and laboratory improvements in the physical setup of the laboratory. Very often such equipment items are high-cost items and require the approval of the institution’s budgetary administration.

7.

B. Although the other items have had an impact on health care today, the Medicare and Medicaid legislation of 1966 has had the greatest influence on the industry because it determines the reimbursement of healthcare services. This legislation provides a mechanism for financing the healthcare of elderly persons and poor persons. In 1960, the federal government financed 9.3% of health care. In 1984, 29.6% of all healthcare expenditure was paid by the federal government through Medicare and Medicaid, and this figure continues to rise. As of 2004, this agency is known as the Centers for Medicare and Medicaid Services (CMS).

8.

C. Requiring a license is the most restrictive form of government regulation of professional practice. Licensure makes it illegal for an unlicensed organization or individual to provide a

professional service within a scope of practice that is defined by statute. Licensing is designed to protect the public from inadequate manufacturing practice and incompetent practitioners.

9.

A. Laboratory hours, procedures offered, workload trends, and leave patterns are important factors to consider in the scheduling process. In addition, the physical design of the facility, financial considerations, the abilities and qualifications of personnel involved, and the ratio of urgent procedures to routine work should be considered. Employee preference is not a factor that is pertinent to scheduling.

10.

A. Causation is the act or process of causing that which is needed in order for a lawsuit to be initiated. Wrongful conduct is cause for a lawsuit. Intentional acts are those that a person intends to commit and intends to result in harm to someone else. Negligent acts are defined as the failure to do something that a reasonable person, guided by the considerations that ordinarily regulate human affairs, would do or not do. Strict liability applies to product liability and to the performance of a service.

11.

D. DRG stands for diagnosis-related group. These groups of diagnoses were developed by the federal government in the 1970s and adopted in the 1980s. The groupings provide a method of determining reimbursement for Medicare patient care by the federal government and have been used by hospital management for budgeting and planning. Several states (e.g., New Jersey, Maryland) are using a slightly different or modified version.

12.

C. On August 1, 2000, the Centers for Medicare and Medicaid Services (CMS) and the Office of Inspector General (OIG) instituted the use of an outpatient prospective payment system (PPS) known as APC (Ambulatory Payment Classification). Mandated by the Omnibus Budget Reconciliation Act (OBRA) of 1990, APCs comprise an outpatient PPS that parallels the inpatient DRGs. PPS rates are established for each group of services provided in hospital outpatient departments for the diagnosis and treatment of Medicare beneficiaries. Services are grouped by the APC groups, which categorize services according to similarity of clinical diagnosis and resource use. The capitated rate is a fixed rate of reimbursement for health care organizations to a minimum amount per covered life. This is a process used by managed care organizations and insurers. Under capitation, a payer pays a provider a fixed amount for each member of the plan who is assigned to receive services (laboratory, radiology, cardiology, etc.) during any given month.

13.

B. A good performance appraisal should include a complete job description, performance standards based on the job description, and a regularly scheduled evaluation using the first two factors. The performance appraisal system as a whole should combine the evaluation process with a thorough discussion with the employee once he/she has had time to review the written evaluation. The appraisal should occur on a regular basis, and at a minimum of once a year.

14.

B. Benchmarking is the process whereby the best process in one organization is modified to fit similar processes in another organization. Generally, a business case is developed for making changes that will result in improvements. Examples of benchmarking data utilized in the laboratory environment include cost per test,

tests performed per FTE, number of corrected reports, and capital expenditures.

15.

C. Cost analysis, forecasting, determination of fixed and variable costs, and breakeven analysis are all parts of the budget-making process. These tools must be used in the determination of all costs before any intelligent forecast or budget can be made. All have become increasingly important in today's climate of stringent reimbursement methods.

16.

B. Questions regarding race, age, and childcare needs are all inappropriate in an interview; only the applicant's experience is relevant. There are many other areas, such as marital status, arrests, credit history, religious affiliation, and spouse's occupation, that also should not be discussed. Education and past employment experience, as well as interests and short- and long-range plans, are appropriate areas in which to concentrate.

17.

D. Job descriptions will vary from one institution to another. However, the position title, job responsibilities, necessary qualifications, and job relationships should be part of any job description. Some other aspects that may also be covered include immediate supervisor, limitations or hazards, training, working conditions, skills, shift worked, and section or division assigned.

18.

C. Positive discipline should involve privacy, be timely, and be progressive, although it is not necessary that it be in a written format. Discipline can be informal and oral in the early stages, and it should always be private. Disciplinary action may progress through the following stages: oral, informal talk; oral warning or reprimand; written warning; disciplinary layoff or similar penalty; demotional downgrading; and discharge.

19.

C. The Food and Drug Administration (FDA) is the only compulsory agency that currently develops and implements standards and practices for blood banks. The American Association of Blood Banks (AABB) is also an agency that performs these functions but it is a voluntary, not compulsory, program. The Occupational Safety and Health Administration addresses safety practices in the laboratory overall, but does not develop specific practices for blood banks. The Prospective Payment System has to do with Medicare reimbursement and is not an agency dealing with blood banks.

20.

D. Staff development that generally improves the capabilities of the laboratory worker, improvement of laboratory functioning through in-service programs, and the meeting of accreditation requirements are important goals of a continuing education program. These goals may be accomplished by means of seminars, journal clubs, lectures, workshops, and so forth. Participation in continuing education programs is the responsibility of every laboratory professional and should be maintained throughout the career.

21.

A. Employee salaries, supplies, repair and maintenance of instruments, and fixed expenses are line items in a laboratory budget. Also considered line items are employee benefits, purchased services, allocations, and miscellaneous expenses. The aforementioned items can be further broken down into smaller, more specific components; for example, employee benefits include such items as life and health insurance, vacations, holidays, sick leave, and pensions.

22.

A. The College of American Pathologists (CAP) accredits hospital and associated laboratories.

CAP inspects clinical laboratories every 2 years. The FDA is responsible for the inspection of blood banks and this is done on an annual basis. In the event a laboratory is not accredited by CAP, the Joint Commission will handle the inspection as part of the overall hospital assessment.

23.

A. Marketing, as a specific function of management, may be defined as the strategic process of attracting and maintaining a customer base. Without success in this area, the very survival of the organization may be placed in jeopardy. Marketing has to do with how the laboratory deals with the new reimbursement and the restructuring of the laboratory delivery system.

24.

C. There is no question that the person toward whom the laboratory directs its professional concerns is the patient. However, the laboratory must also identify the customer—the entity that sends the patient to the laboratory. The discretionary buyer is the entity that decides where a service is performed. The discretionary buyer may be the patient, a physician, a third-party payer, or even another institution. Market research shows that the mother is usually the one who decides where the family receives medical care. For this reason much of healthcare's promotional focus is on the mother and on women in general and associated family issues.

25.

B. Product costs are an integral part of cost accounting. Labor and consumables are product costs. To calculate the cost per test of a particular assay you must include quality control (QC) material as part of the total cost to perform a particular assay. When calculating the QC direct labor cost per test you need to know the total number of QC tests performed each year, the total profiles performed per year, and the total direct labor cost. Therefore, the QC direct labor cost per profile would be:

$$\frac{(2400 \times \$1.50)}{60,000} = \$0.06/\text{profile}$$

To calculate the QC consumable costs you need to know the cost for a year's supply of QC reagents and the total profiles performed per year. Therefore, the QC consumable cost per profile would be:

$$\frac{\$3000}{60,000} = \$0.05/\text{profile}$$

26.

C. Breakeven analysis is used to determine how many units or in this case tests must run to recoup your costs (both fixed and variable) and make your net income (in this case, zero). A laboratory might use this to see how much a new test would cost them to implement. The formula to calculate the breakeven point is as follows:

$$rx = vx + f + c$$

where

$$\begin{aligned} r &= \text{revenue per unit} \\ x &= \text{breakeven point} \\ v &= \text{variable costs} \\ f &= \text{fixed costs} \\ c &= \text{net income} \end{aligned}$$

For this particular problem, the values are

$$\begin{aligned} x &= \text{breakeven point—this is the unknown that you are trying to determine} \\ r &= \$10.00 \text{ per test} \\ v &= \$2.00 \\ f &= \$400.00 \\ c &= 0 \text{ (net income with no profit and no loss)} \end{aligned}$$

So

$$\begin{aligned} 10(x) &= 2(x) + 400 + 0 \\ 10x - 2x &= 400 \\ 8x &= 400 \\ x &= 50 \end{aligned}$$

The laboratory would have to perform a minimum of 50 tests to reach the breakeven point and meet both the fixed and variable costs. Once the lab determines that the test should be included in its menu, the next step might be to determine what net income is necessary to maintain the test.

27.

B. An important concept in salary and wage management is the calculation of full-time equivalents (FTEs), which can be used for setting and measuring budgeting and staffing goals. To calculate FTEs, divide the number of hours (total = productive and nonproductive) by 2080, the number of hours a full-time person works in 1 year (40 hours per week \times 52 weeks = 2080). In this example, in order to calculate the total FTE needed, you need to know the total hours paid and the number of hours an FTE works in a year.

$$\frac{14,159 \text{ total hours paid}}{2080 \text{ hours/person}} = 6.8 \text{ total FTEs}$$

To calculate the productive FTE you need to know the productive hours worked. This is determined by

$$14,159 \text{ total hrs paid} - 1263 \text{ nonproductive hrs} = 12,896 \text{ productive hours}$$

The number of productive FTEs equals:

$$\frac{12,896 \text{ productive hours}}{2080 \text{ hours/person}} = 6.2 \text{ productive FTEs}$$

28.

B. The Office of Inspector General (OIG) and other federal agencies charged with responsibility for enforcement of federal law have emphasized the importance of voluntarily developed and implemented compliance plans. In recent years, the OIG has been asked to supply guidance as to the elements of a model compliance plan. The purpose of this issuance, therefore, is to respond to those requests by providing some guidance to health care providers that supply clinical laboratory testing services for Medicare and Medicaid beneficiaries.

29.

C. Coinsurance is the portion of the cost of an item or service that the Medicare beneficiary must pay. Currently, the Medicare Part B coinsurance is generally 20% of the reasonable charge for the item or service. Typically, if the Medicare reasonable charge for a Part B item or service is \$100, the Medicare beneficiary (who has met the deductible) must pay \$20 of the physician's bill and Medicare will pay \$80.

30.

A. The Equal Employment Opportunity Commission (EEOC) was established by Title VII of the Civil Rights Act of 1964 and began operating on July 2, 1965. The EEOC enforces the principal federal statutes prohibiting employment discrimination, including Title VII of the Civil Rights Act of 1964, the Age Discrimination in Employment Act of 1967, the Equal Pay Act of 1963, Title I of the Americans with Disabilities Act (ADA) of 1990, and Section 501 of the Rehabilitation Act of 1973.

31.

B. Quality assurance (QA) developed out of the limitations of the QC approach and defined quality in healthcare institutions by the success of the total organization, not just individual components of the system, in achieving the goals of patient care. When introduced by the Joint Commission in 1980, quality assurance was defined as the overall activities conducted by the institution that are directed toward assuring the quality of services provided. QA focuses on the recipient—namely, the patient.

32.

D. Edward Deming is often credited with providing the Japanese with the information and training that brought them to their position as the world's leader in the production of quality products. A statistician who worked with Walter Shewhart, he introduced the use of statistical tools in decision making, problem solving, and troubleshooting the production process. Deming is also frequently cited as the source of most of the concepts and methods contained in the total quality management (TQM) model.

33.

C. Straight-line depreciation is a method based on the time element. As a product grows older, its value decreases and maintenance costs increase. This method can be used for all capital items, but it is usually used to establish depreciation rates for buildings and other structures with an extended life expectancy (i.e., greater than 10 years). Land is considered to last forever and is never depreciated. Therefore,

$$\text{Annual depreciation} = \frac{\text{cost of project} - \text{salvage value}}{\text{Life expectancy}}$$

$$\begin{aligned} \text{Annual depreciation} &= \frac{\$800,000 - (\$200,000 + \$40,000)}{20 \text{ years}} \\ &= \frac{\$800,000 - \$240,000}{20 \text{ years}} \\ &= \$28,000/\text{year} \end{aligned}$$

34.

B. Clinical practice guidelines are published by professional medical groups, insurers, federal agencies and departments, and other groups that recommend when a selected medical procedure, test, or practice should be used. Clinical pathways

are developed by hospitals for specific diseases or conditions (e.g., pneumonia, hip replacement) by the medical staff and other healthcare personnel. They may include some of those practice guidelines determining what test, procedure, or practice should be used when treating a patient with that disease or condition, so that quality treatment is consistent from patient to patient. Quality assurance is a program in which the overall activities conducted by the hospital are directed toward assuring the quality of the products and services provided. The outcomes assessment is used to measure the value of the clinical practice guidelines, clinical pathways, and quality assurance program that the hospital has decided to put in place.

35.

A. A general supervisor, who must be responsible for day-to-day supervision, is stipulated for laboratories doing high-complexity testing. This is a laboratorian with an associate's degree or higher in medical laboratory technology and 2 years of training and experience in a high-complexity laboratory. The director and technical consultant must be a doctoral-level scientist with an appropriate laboratory specialty or a physician with training or experience in laboratory medicine. A physician or doctoral-level clinical scientist may provide the services of a clinical consultant.

36.

D. Personnel requirements are not required to be part of the Standard Operating Procedure Manual (SOPM). Tests are categorized by waived, moderate complexity, and high complexity. The type of personnel allowed to perform testing is determined by these categories as described by the Clinical Laboratory Improvement Amendments (CLIA) of 1988.

37.

B. Participation and involvement allow subordinates to be part of the planning or implementation of change. It is an excellent method when the manager does not possess the expertise or knowledge to implement change himself or herself and the resisters have significant power to impede the manager's efforts. Participation often generates commitment by the participants to the change process. This approach can also result in time-consuming compromise that does not fit the organizational needs. It must be carefully handled, because once a decision has been made by the group, it is difficult for the manager to push it aside.

38.

C. Conflict does not usually appear overnight. It often festers without the knowledge of the recipient party. Conflict usually passes through several progressive stages before it manifests itself to others. The parties may be at different stages of the conflict cycle, which complicates management of conflict. The manager must have a keen sensitivity to and understanding of his/her work environment to deal effectively with conflict at all stages.

39.

A. Staff authority is exercised through such positions as the lab safety officer or quality assurance coordinator—those areas that provide supportive services in a more indirect fashion, where ability to implement change depends on the action of the section supervisors. They exercise their influence by making recommendations, providing specific support services, giving assistance and advice in technical areas, facilitating paperwork and other procedures, and developing general lab policies. Line authority is supervisory responsibility assigned through the formal delegation of authority—in the lab this is from administration to department head to supervisor to staff. Functional authority is the

power to enforce directives, such as physician's medical orders, within the context and boundaries of a clearly defined specialty and span of control. Formal authority is the official, sanctioned lines of authority assigned by the owners of the organization.

40.

C. Members of organizations receive communications from two sources, formal and informal. Formal comes from two directions in a company—from above or below. Vertical communications take the form of memos and other directives that come down through the bureaucratic hierarchy and the responses and other information that make their way back up through the same network. Horizontal communication occurs in the course of the normal exchange of services, information, and work orders, when managers and staff talk to each other as peers.

41.

B. Engineering and work practice controls involve taking physical steps to isolate or remove any possible pathogen hazards from the workplace. The Occupational Safety and Health Administration (OSHA) requires specific engineering action by employers. Some primary areas where these actions are required include handwashing facilities, needles and sharps, and procedures that minimize splashing, spraying, and generating aerosols. Although work practice controls are developed by OSHA, the Joint Commission and the College of American Pathologists (CAP) also require that these work practice controls be in place to become accredited. The Centers for Disease Control and Prevention (CDC), just like any other lab, is required to follow the same work practice controls.

42.

C. The Community Health Information Network (CHIN) links all healthcare participants involved in the continuum of care under one computerized communication channel. This channel, or electronic highway, serves as the information's translation medium. It enables members of the healthcare community to talk to one another without leaving their computer terminals, learning another computer language, or buying another computer system. A sophisticated security system allows only authorized users to access information contained in various databases at its members' systems.

43.

D. At a certain patient census, the hospital should have a specific number of employees. When the number of patients increases, more staff is hired; when the census drops, employees are laid off. In practice this has been difficult to implement because of recruitment and retention problems. Even supplies must be ordered in advance to ensure adequate levels. For this reason, a flexible budget similar to the forecast method is prepared and then closely monitored to ensure that projections are on target.

44.

B. The process of submitting capital plans for governmental approval is required for projects, equipment, or buildings above an established monetary level. Most states have set this limit at \$150,000, following federal guidelines. A Certificate of Need (CON) must also be obtained before new services such as oncology or obstetrics can be offered. This program was established in an attempt to control medical costs and to avoid duplication of services and the overbuilding of hospital beds.

45.

C. Payback period = P/I , where P = purchase price of project and I = annual income generated. Many investors and lenders perform this calculation to determine the length of time needed to recover their investment. Businesses use this same formula to assist in determining the affordability of a project. By the nature of the business, laboratory instruments need a relatively shorter payback period because of the rapid technological obsolescence in the field.

$$\begin{aligned}\text{Payback period} &= \frac{\$150,000}{\$420,000/\text{year}} \\ &= 0.36 \text{ year} \times \frac{12 \text{ months}}{1 \text{ year}} \\ &= 4.3 \text{ months}\end{aligned}$$

46.

D. Depreciation is not part of the total cost per test but is part of the overall budget. The way depreciation is determined and recorded has a direct impact on the financial status of the company as a whole. The total cost per test can be determined by adding together direct and indirect labor, direct and indirect materials, and equipment and overhead costs. Direct labor cost includes the cost of technical personnel who actually perform the testing. Indirect labor cost represents the cost of all other laboratory support and supervisory personnel. Direct material includes reagents, sample cups, and pipette tips. Indirect material cost encompasses the cost of shared equipment and supplies that cannot be directly allocated to individual tests, such as the cost of the LIS, centrifuge, or refrigerator. Overhead cost includes the hospital's allocation for utilities, housekeeping, administration, and other costs.

47.

C. The team leader, to be successful, must be knowledgeable of the project area and possess the skills for getting cooperation from multi-skilled and multidisciplinary team members. It is helpful if the team leader comes from the unit most impacted by the problem to be solved. Keeping records of team activities and progress is the role of the facilitator. The facilitator is an internal consultant, specializing in the quality process, who works with several team leaders.

48.

B. The CPT is actually Level I of the HCPCS codes. CPT is authored by the American Medical Association and, therefore, most codes are historically identified physician provided procedures. They relate to signs, symptoms, and conditions; their use is important in substantiating procedural orders. Modifiers are attached to CPT codes to further describe a procedure. They can be alpha or numeric in nature. An example used in lab procedures is modifier "91," indicating that the same procedure was performed more than once on the same date of service.

49.

D. Equipment cost is an essential part of determining the total cost per test. In order to determine

the equipment cost per test, you need to know the cost of the equipment, the useful life of the equipment, the annual maintenance cost, and the estimated number of tests to be performed by the equipment you want to purchase.

$$\text{Equipment cost} = \frac{[(E \div L) + M]}{A}$$

where

E = Cost of equipment

L = Useful life

M = Maintenance costs

A = Annual tests performed

Equipment cost =

$$\frac{[(\$55,000 \div 7) + \$8000]}{3500} = \$4.53$$

50.

C. Empowerment allows an employee to determine what task and how to accomplish the task to help the manager solve a problem or to allow an organization to come closer to accomplishing its mission and goals. Employees are allowed to be creative and innovative to solve problems. Employees are allowed to take risks without fear of admonishment for failing.

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